User Manual's
Vana Player

This document covers the installation and usage of Vana audio system.

Table of contents

1) Introduction

Thank you for purchasing **Vana player** designed to deliver the highest quality sound possible while streaming through the Sparky SBC or the RPI using Max2play and Airplay.
Each board composing the Vana has a specific task and together, they offer Bit perfect Playback, jitter-less I2S and uncompromised Audio Quality at a maximum sample rate of 192KHz / 24bits.

Overview:

● Available with different output connectors,

- 2x Speaker terminals (Left & Right)

- 2x RCA Audio Out (Left & Right) for Piano

- 4x RCA Audio Out (Left, Right, Sub Left & Sub Right) for Piano 2.1

- 1x 3.5mm phone jack

● The Power Barrel for kali s 2.5mmID and for Volt is 3mmID.

● The Volt is designed to operate with +19V.

● The Kali is designed to operate with +5V and same power is feeding to SBC (Sparky/RPI) as well as Piano Board.

2) The Piano

The Piano is a fully HAT compliant add-on board.

The Piano takes the digital audio signal (I2S) from the Sparky/RPI and through the onboard Texas Instruments PCM5122 DAC IC, delivers variable output analog audio to the Piano RCA connectors. The Piano also, via the Texas Instruments TPA6133A headphone amp, supports the direct use of headphones via the Piano's 3.5mm audio jack.

The Piano can be connected to the Sparky's 40way pin header without any additional soldering.

Component selection, Digital-Analog Partition and track layout have been in the forefront of our design to ensure noise immunity and best possible audio playback with the Piano.
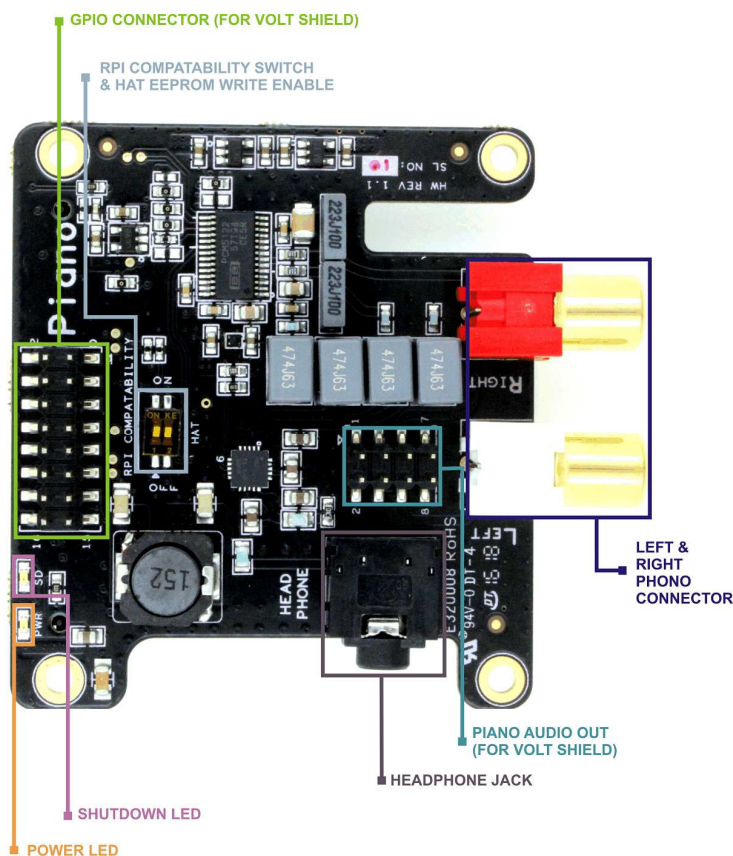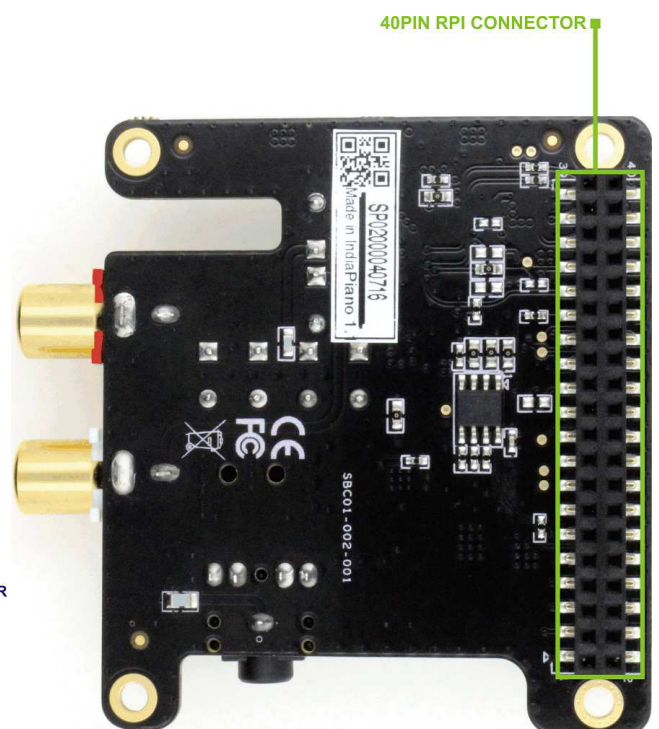

Fig: 1 Top Side Piano   **Fig: 2 Bottom Side Piano**

![Allo logo](allo.com)

3) The Kali

WARNING: You need to power the KALI board when used with Sparky.

WARNING: Do not connect any jumper caps on the provision for external +5V DC Power IN. This is only for external testing purpose.

The Kali takes the digital audio signals (I2S) from Sparky/RPI through the on board FPGA based FIFO and does the re-clocking of signal before sending it to the DAC. It produces jitter-less I2S that it then feeds to the Piano DAC.

Two low phase noise crystal oscillators generate the Master clock. It provides accurate Master clock to DAC and FPGA.

The Kali requires a +5 Volt power source to operate. Power should be applied to the 2.5mm DC JACK.

This same power source only feeding to SBC (Sparky/RPI) and Piano/DAC boards.

Component selection, Digital-Analog Partition and track layout have been in the forefront of our design to ensure noise immunity and best possible audio playback with the Kali.
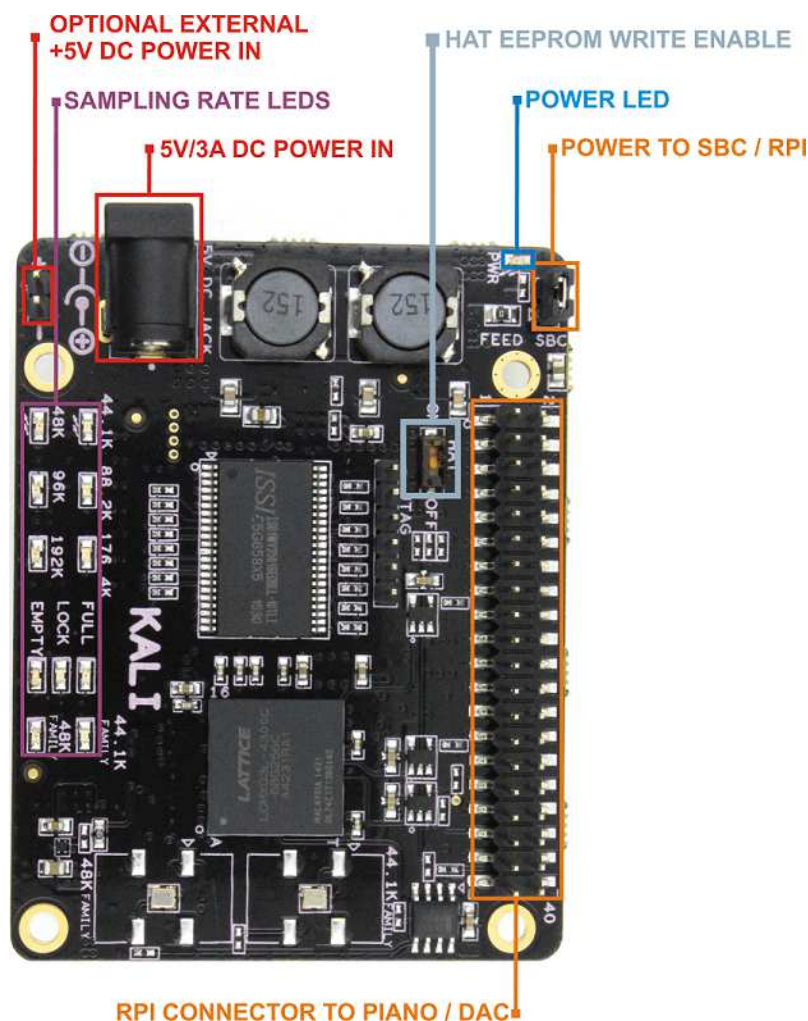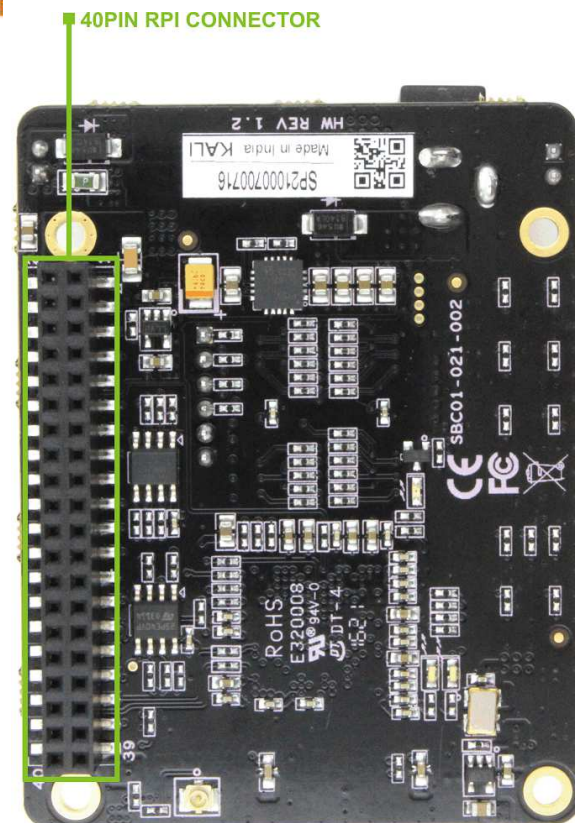

Fig: 3 Top Side Kali

Fig: 4 Bottom Side Kali

4) The Piano 2.1

The Piano 2.1 takes the digital audio signals (I2S) from the Sparky/RPI and through the onboard Texas Instruments (PCM5142 x2) DAC delivers variable output analog audio to the Piano2.1 RCA connectors. PIANO 2.1 uses 2 DAC ICs: One for Analog Audio(Left & Right) and Another for Analog Audio(SUB LEFT & SUB RIGHT).

The Piano2.1 can be connected to the Sparky's 40way pin header without any additional soldering.

Component selection, Digital-Analog Partition and track layout have been in the forefront of our design to ensure noise immunity and best possible audio playback with the Piano2.1.
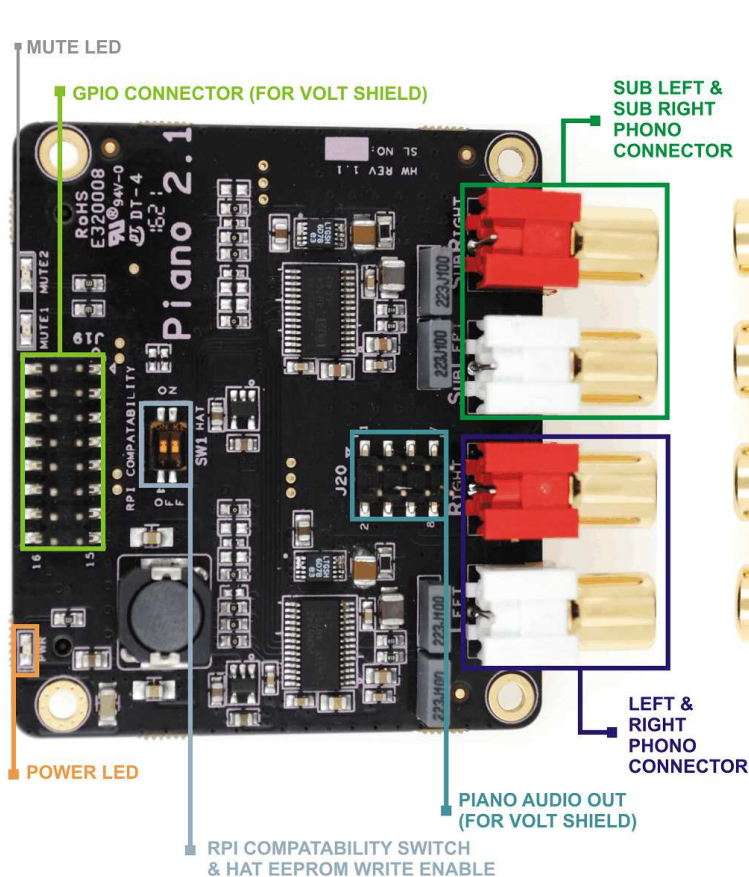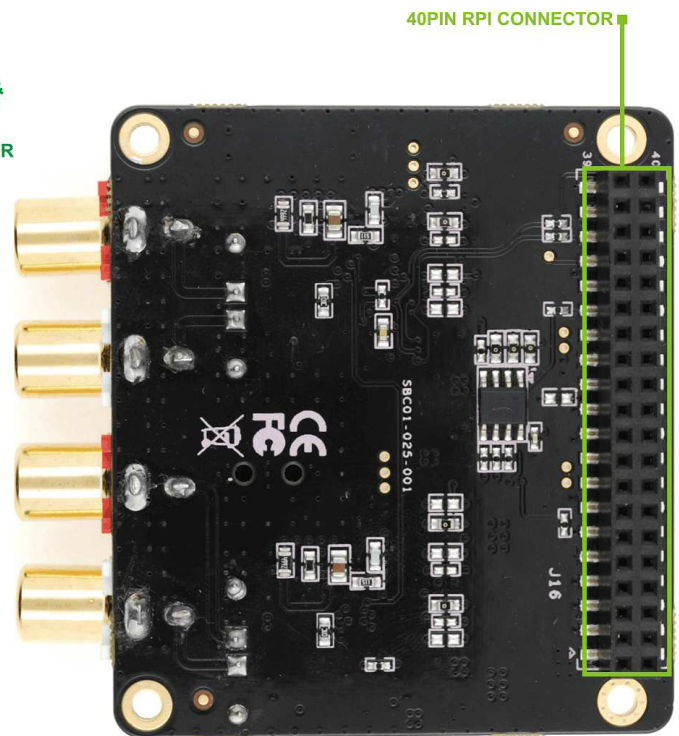

Fig: 5 Top Side Piano 2.1   **Fig: 6 Bottom Side Piano 2.1**

5) The Volt

The Volt takes the variable output analog audio from the Piano(or)Piano2.1 and through the onboard Texas Instruments TPA3118D2 Class D amplifier delivers audio to the volt speaker terminals delivering up to 2x50w@19v input.

The VOLT requires a 19volt power source to operate. Power should be applied to the 3mm DC JACK.

For other boards (Kali, Piano, Sparky / RPI), Power is taken through the Kali board (+5V).

The Volt is by default muted at power on (mute LED lit). Mute & Shut down state / LED is under software control.
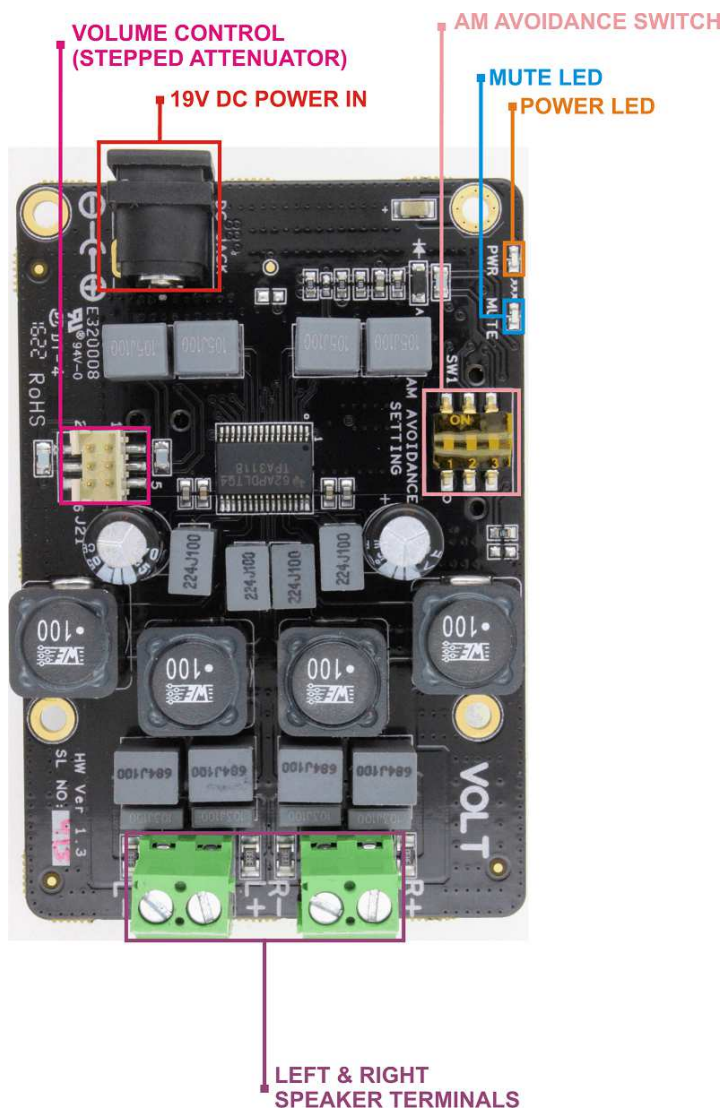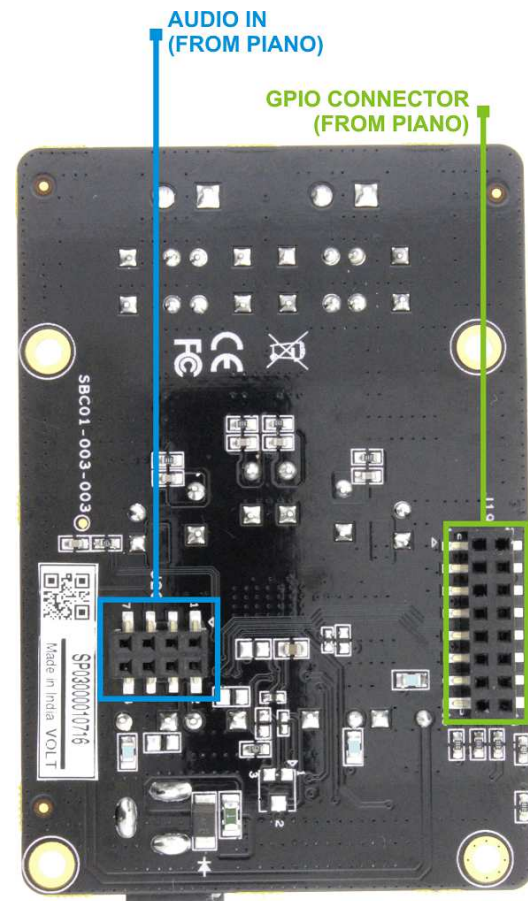

Fig: 7 Top Side Volt   Fig:8 Bottom Side Volt

6) Connecting the Kali to your SBC (Sparky/RPI)

WARNING: PLEASE ENSURE ALL CABLES ARE DISCONNECTED FROM THE SPARKY/RPI BEFORE ATTEMPTING THIS PROCEDURE.

The KALI can be connected to the SBC (Sparky/RPI)'s 40way pin header without any additional soldering.
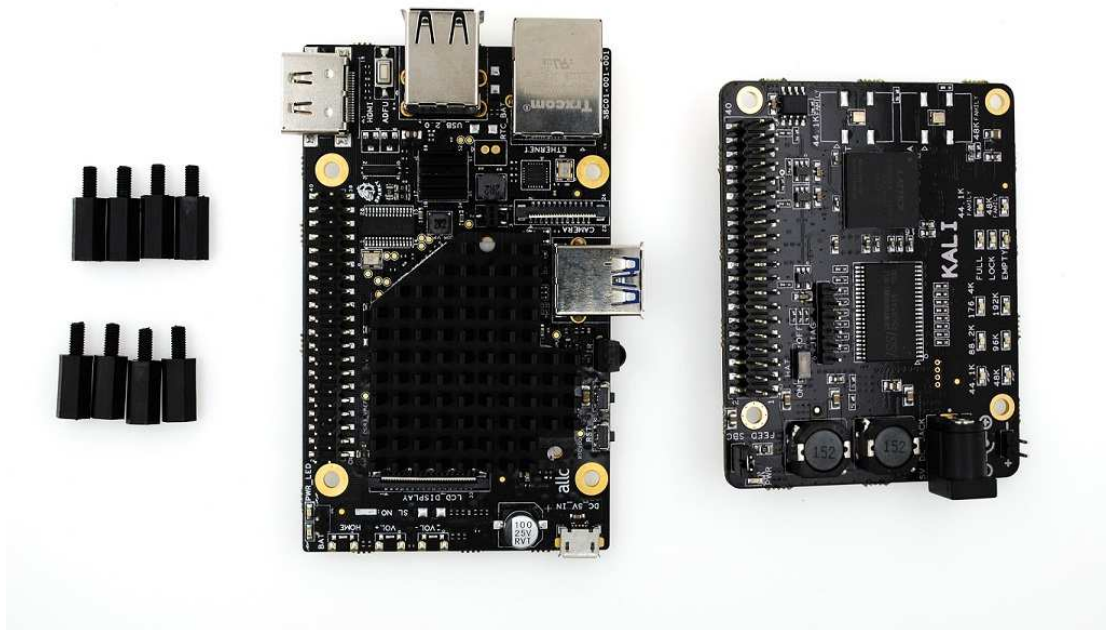
The KALI is supplied along with 8x 12mm PCB spacers

Fig: 9 SPARKY + KALI + spacers

The spacers should be screwed (finger tight only) below and above of the SBC(Sparky/RPI),before adding the KALI.
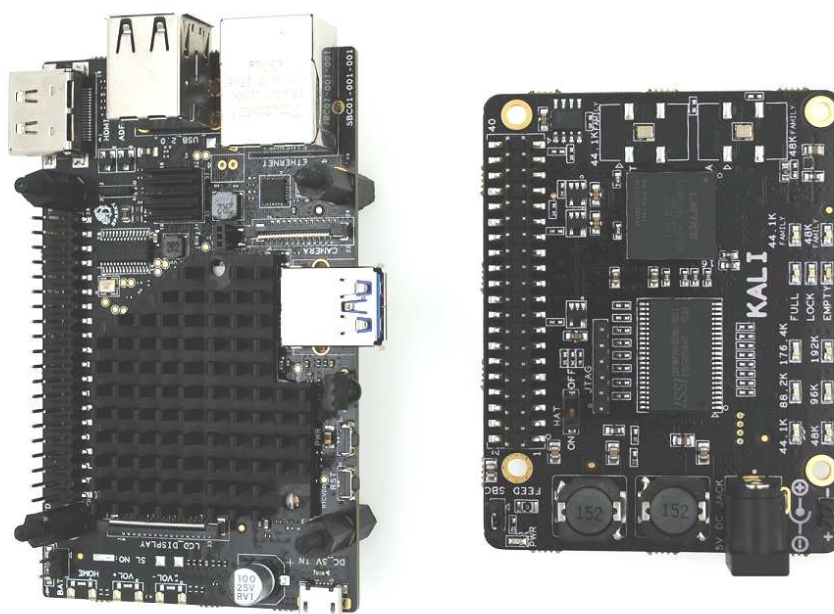

Fig: 9a SPARKY + KALI + Assembled spacers.

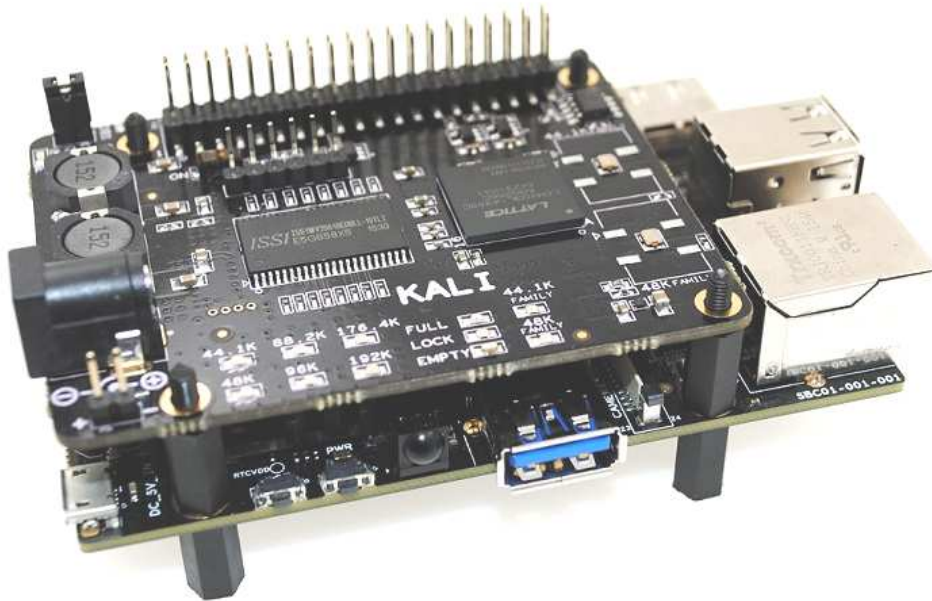Fix the Kali board to SBC (Sparky/RPI) along with spacers.

Fig: 10 SPARKY + KALI

7) Connecting the Piano to your SBC (Sparky/RPI)+KALI

WARNING: PLEASE ENSURE ALL CABLES ARE DISCONNECTED FROM THE SPARKY/RPI BEFORE ATTEMPTING THIS PROCEDURE.

The PIANO can be connected to the SBC (Sparky/RPI)'s + KALI 40way pin header without any additional soldering.

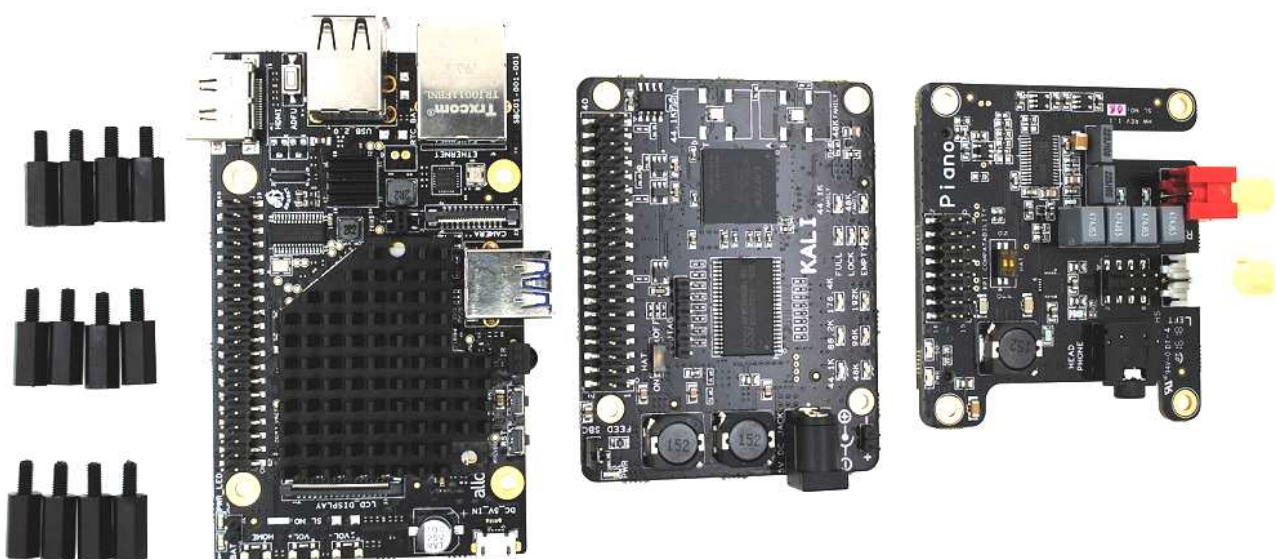The PIANO is supplied along with 4 x 12mm PCB spacers.

Fig: 11 SPARKY + KALI + PIANO + SPACERS

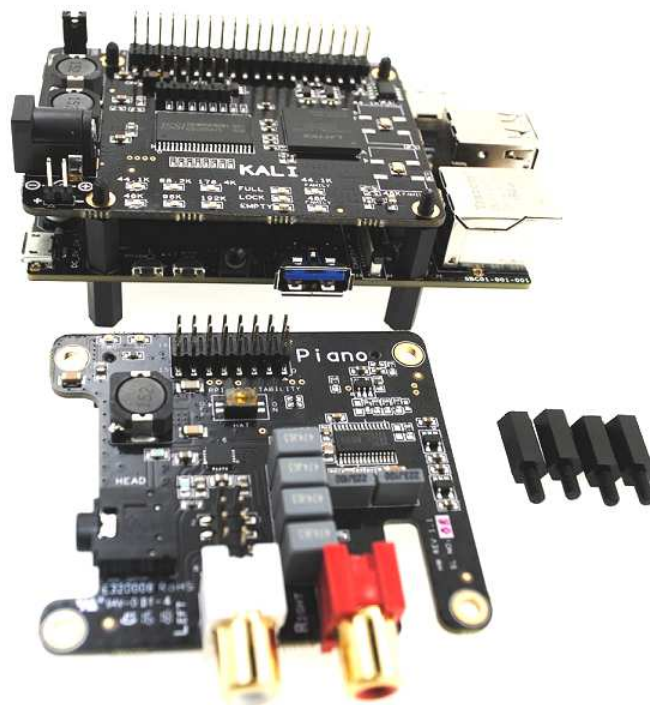Now you can fix the SPARKY +KALI along with spacers.

Fig: 12 (SPARKY + KALI) Assembled + PIANO + SPACERS

Fix the Piano board to SBC (Sparky/RPI)+KALI along with spacers.

Fig: 13 (SPARKY + KALI+PIANO) Assembled

8) Connecting the VOLT to your SBC (Sparky/RPI)+KALI+PIANO

WARNING: PLEASE ENSURE ALL CABLES ARE DISCONNECTED FROM THE SPARKY/RPI BEFORE ATTEMPTING THIS PROCEDURE.

The VOLT can be connected to the SBC (Sparky/RPI)'s+KALI+PIANO with (GPIO & AUDIO OUT) pin header without any additional soldering.

The VOLT is supplied* along with 4x 12mm PCB spacers.

Fig: 14 SPARKY + KALI + PIANO + VOLT + SPACERS

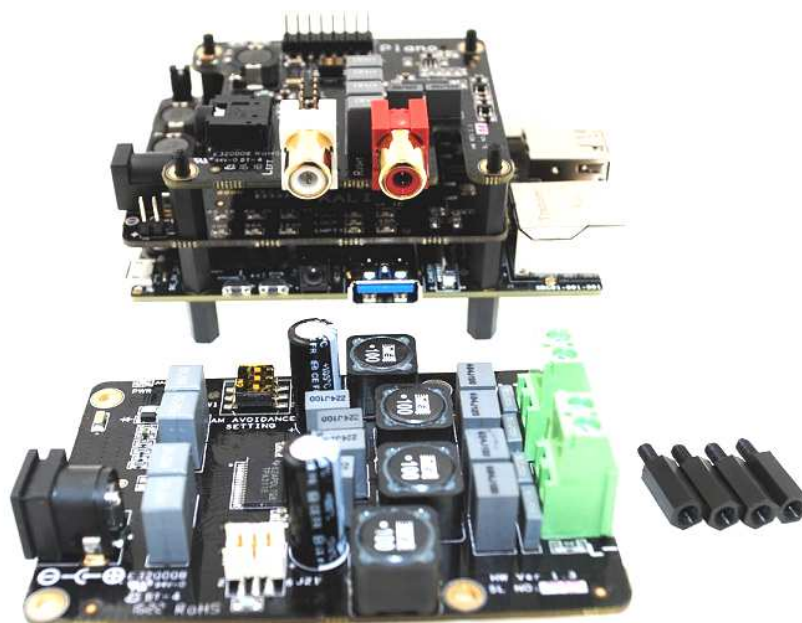Now you can fix the SPARKY +KALI +PIANO along with spacers.

Fig: 15 (SPARKY + KALI+PIANO) Assembled + VOLT + SPACERS

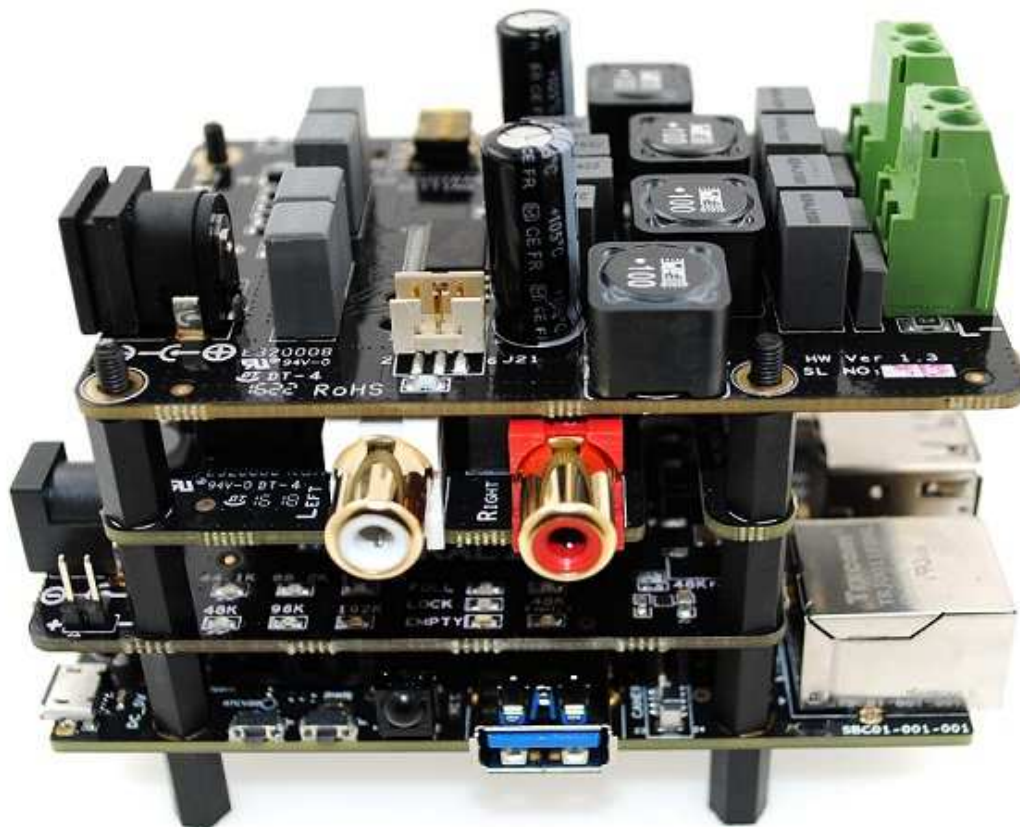Fix the VOLT board to SBC(Sparky/RPI)+KALI+PIANO along with spacers.

Fig: 16 (SPARKY + KALI+PIANO+VOLT) Assembled

9) Micro SD Card Insertion

*WARNING: PLEASE Connect the SD Card, before building the Acrylic CASE.

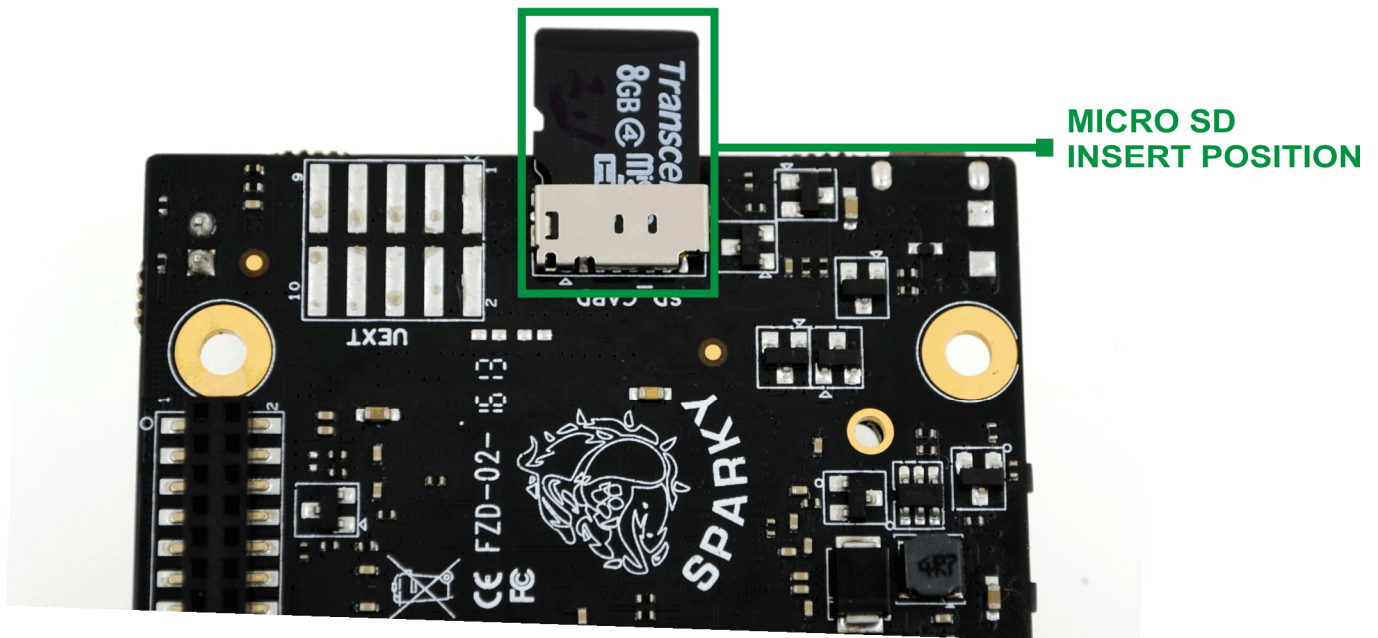Please follow the below diagram (Fig:17 of insertion of Micro SD Card position).

MICRO SD INSERT POSITION

Fig: 17 Insertion of Micro SD Card position

10) Building the VANA into your CASE

All acrylic CASE installations follow the same process:
- ∞ Bolt the PCBs together before attempting to install the bundle in the case. Make sure the Small 12mm female/male spacers are fitted to the bottom of the SBC(Sparky/RPI). Add the 24mm female/female spacers are fitted to the top of the Volt Board.
- ∞ Add the bottom and top
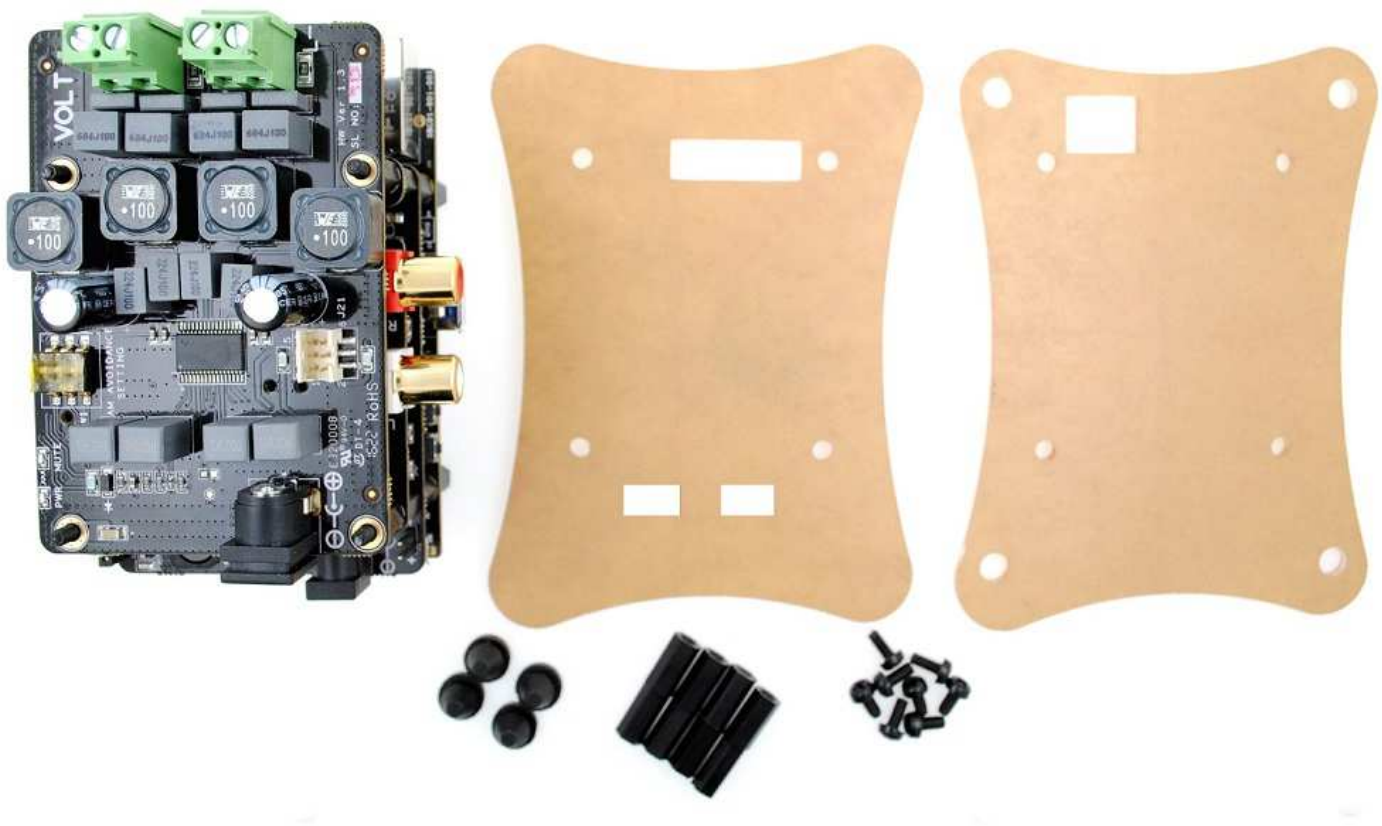- ∞ Add the Screws (M3) and small rubber bumper stickers.

Fig: 18 VANA + Acrylic CASE + Spacers +Screws +Rubber bumper

Fix the complete assembly of VANA with Acrylic Case.

Fig: 19 FRONT VIEW with CASE.

Fig: 20 TOP VIEW with CASE.

11) VANA Board hardware Connections

Follow these step by step instructions to connect the audio interfaces and other interfaces like HDMI, USB, Ethernet, etc..

Step 1*: Please ensure SD Card inserting properly.

Step 2: Connect HDMI Cable and USB Keyboard./Mouse.

Step 3: Connect the Ethernet LAN cable.

Step 4: Connect the Speaker Cables into the Speaker Terminal .Please ensure the connection for LEFT speaker cable connect with Left Terminal and the Right Speaker cable connect with Right speaker.

Step 5: Connect the +5V DC Adapter into the KALI Board.

Step 6: Connect the +19V DC Adapter into the CM Board. And connect the Output of the CM to VOLT Board.(Refer fig:23)

Step 7: For all hardware connection, please refer the fig: 23 below.

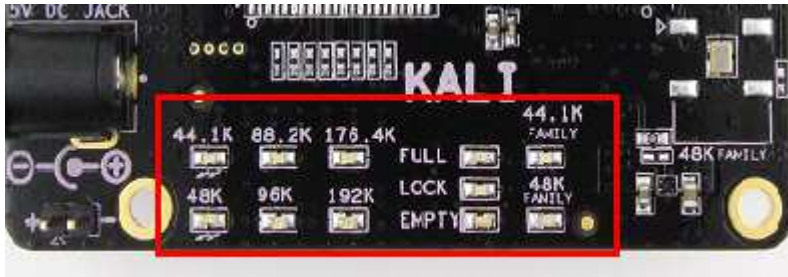*WARNING: PLEASE Connect the SD Card, before building the Acrylic CASE.

12) LED Indications:

Spaky:

 Blue LED - indicates the Power up.

 Red LED - glows 20-50sec after power on. Indicates software booted correctly.

KALI:

1) For Power up Indication -Green LED glow (refer fig:3)

2) While Playing 44.1K Family audio, respective sampling frequency & family LED (Blue) glows.

3) While Playing 48K Family audio, respective sampling frequency & family LED (Green) glows.

4) FIFO status:

                       FULL- Green LED glows FIFO full.

                       LOCK - Blue LED glows FIFO locks to input sample rate.

                       EMPTY - Red LED When FIFO is empty.

PIANO:

Green LED'S - Indicates Power up and Mute status (refer fig:5) - always glow.

      Mute LED off indicates Audio is muted.

      Mute LED on indicates Audio is un-mute(plays).

VOLT:

 Green LED'S - Indicates Power up and Mute status (refer fig:5) - always glow.

      Mute LED off indicated Audio is un-muted(plays)

      Mute LED on indicates Audio is muted.

13) Capacitance Multiplier (CM)

A Capacitance Multiplier is designed to make a small capacitor function like a capacitor that is much, much larger. This design reduces the output ripple/noise of any PSU to almost negligible levels (less than 5mV up to 1Mhz).

Note this is not a voltage regulator. The output voltage will track the input voltage (- dropout voltage). This circuit is very suitable for class A and class D amplifiers or even to feed clean power to your SBCs.
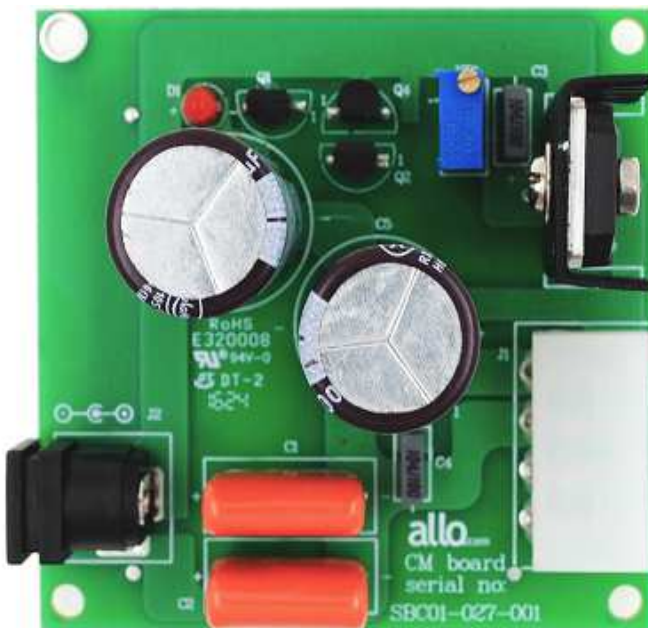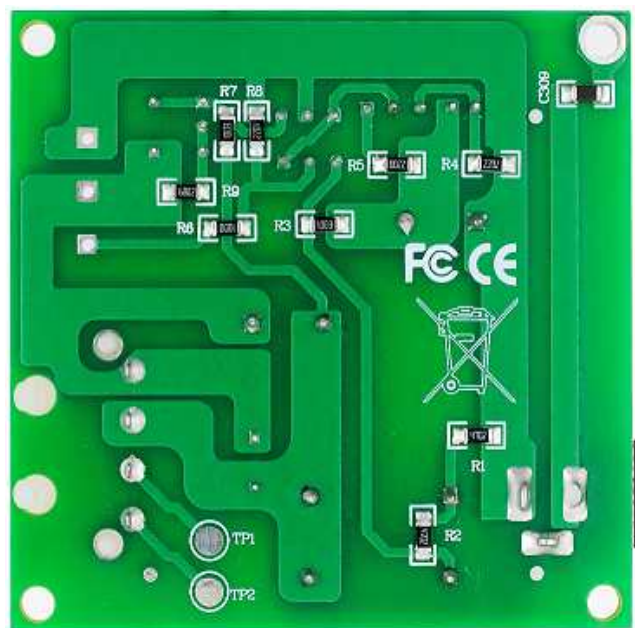

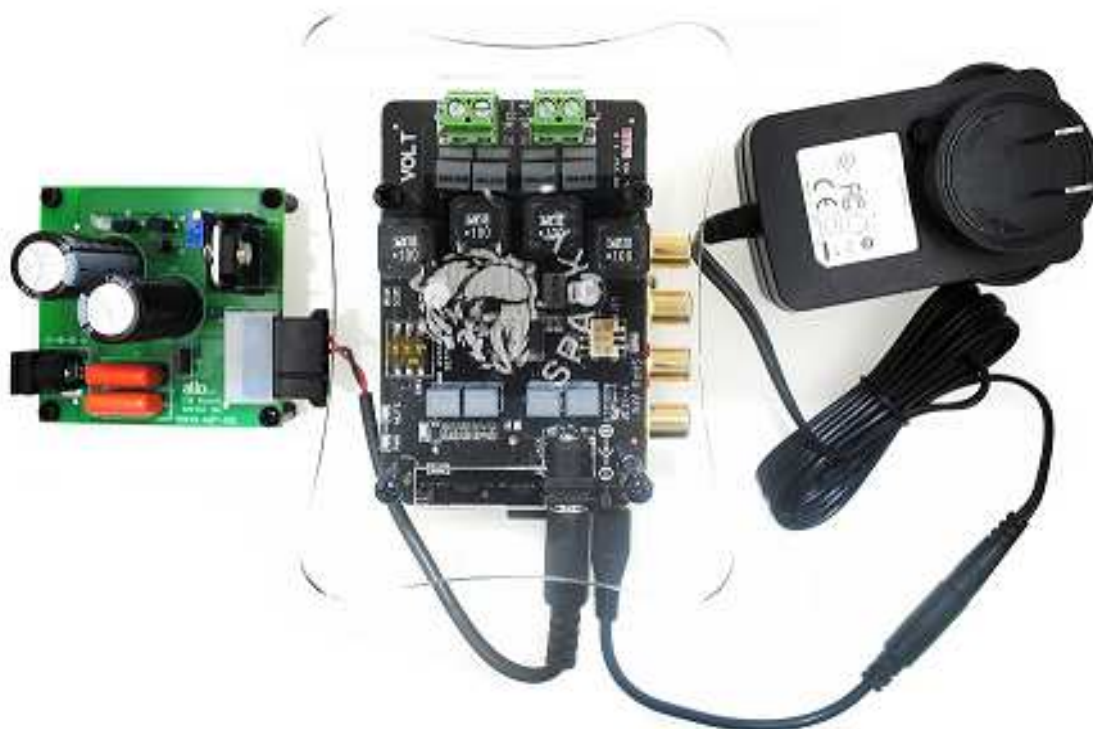**Fig: 21 Top side-CM**   **Fig: 22 Bottom side-CM**

+19V DC IN

LEFT & RIGHT AUDIO OUT
(PHONO CONNECTORS)

+5V DC IN

RIGHT SPEAKER TERMINAL

LEFT SPEAKER TERMINAL
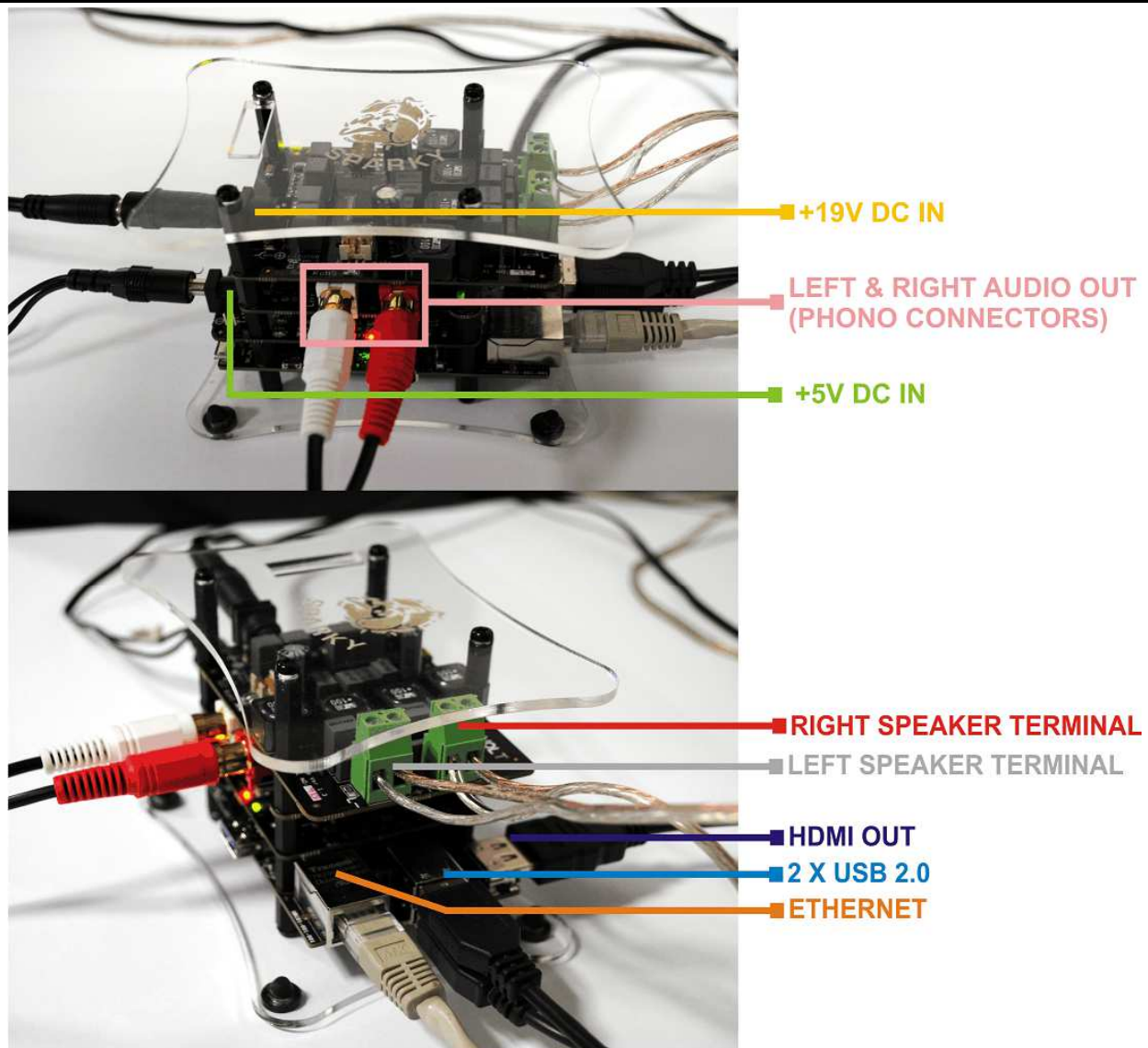
HDMI OUT

2 X USB 2.0

ETHERNET

Fig: 23 VANA Hardware Connections

14) Max2play software configuration for VANA Player

Start up:

1) If a monitor is connected to the HDMI port the login screen of Ubuntu will be displayed
2) The password to login is user name: vana & password: vana (root password : sparky)
3) Make sure the Mobile Phone and SBC are connected to the same network.
4) Type the IP-Address for connecting to the Vana Player. To know the IP address. Look it up in your router or use a tool like Advanced IP Scanner. If you are not able to connect either way, connect a monitor and a keyboard to the Mini-Computer, log in and type "ifconfig".

Max2play page:

To get the Max2play main page, Enter the SBC IP into the Web browser as show below:
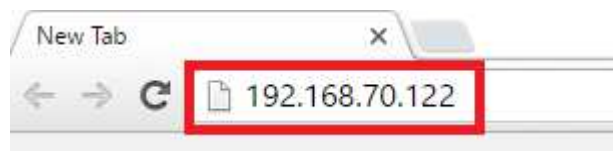
Players:

Max2play for Vana provides two different players Squeezelite and Shairport. Both the Players are set to Auto Start .I.e, The player are started at the bootup no need to start manual unless any configuration changes are required.

A) Squeezelite: It is a software player which works with the Logitech Media Server. To Configure the Squeezelite player click on the "AUDIOPLAYER" on the Max2play web Page as shown below:

B) Shairport: It offers easy playback from Apple devices or iTunes. To Configure the Shairport player click on the "AUDIOPLAYER" on the Max2play web Page as shown below:
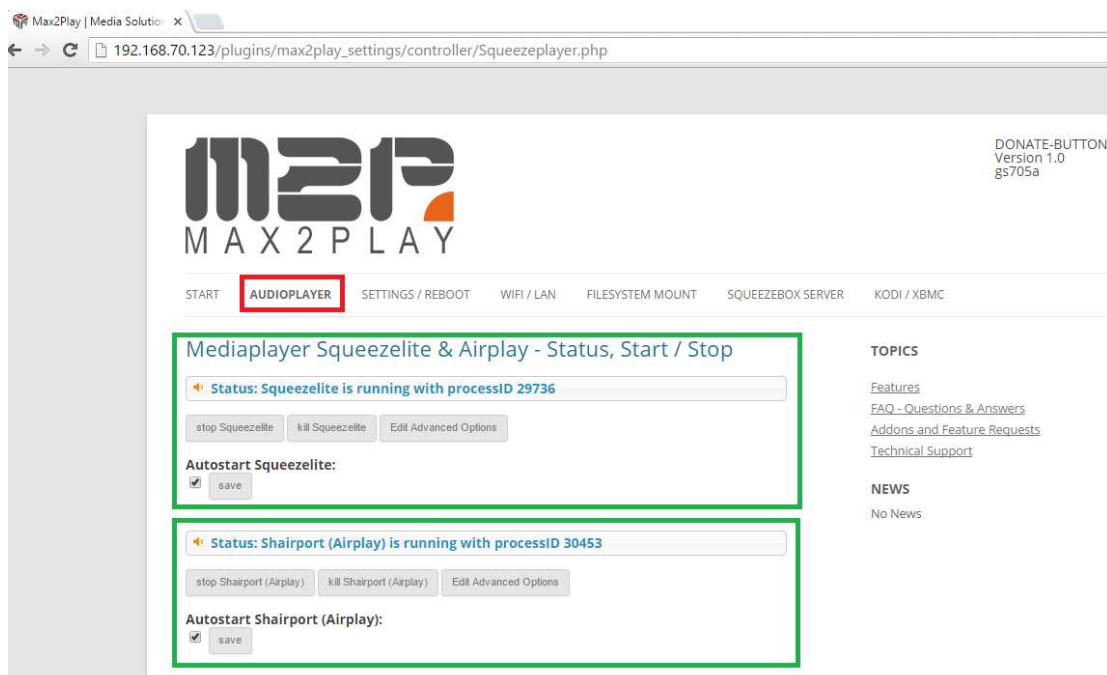
Audio OUTPUT:

Max2play provide different audio Outputs for each of the above player:

    1) Default OR System Default
    2) Equalizer

To configure them Click on "AUDIOPLAYER" in the MAX2PLAY Web page as shown above and then follow the below sequence:

If we want to change the audio output of Squeezelite to Equalizer:

    1) Un-check the auto start and click on save button
    2) Click on "Edit Advance Options" under "Soundcard" select the "Plugequal"
    3) Click on "save" under "Edit Advanced Options" then
    4) Stop the current Squeezelite by clicking on to the "Kill Squeezelite" and start it back by clicking "Start Squeezelite".
   5) Then enable back autostart.

Graphic Equalizer:

Max2play Gives the option to control the Equalizer using the Web based GUI, Go to "AUDIOPLAYER" Web page of Max2play as show below:

To check for the updated configurations of the Graphic Equalizer click on "update" button under "Graphic Equalizer".
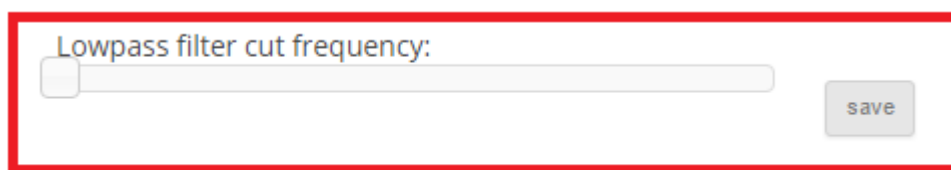
To control the Graphic Equalizer follow the below steps:

1) Change the settings
2) Click on the Save button under the "**Graphic Equalizer**"
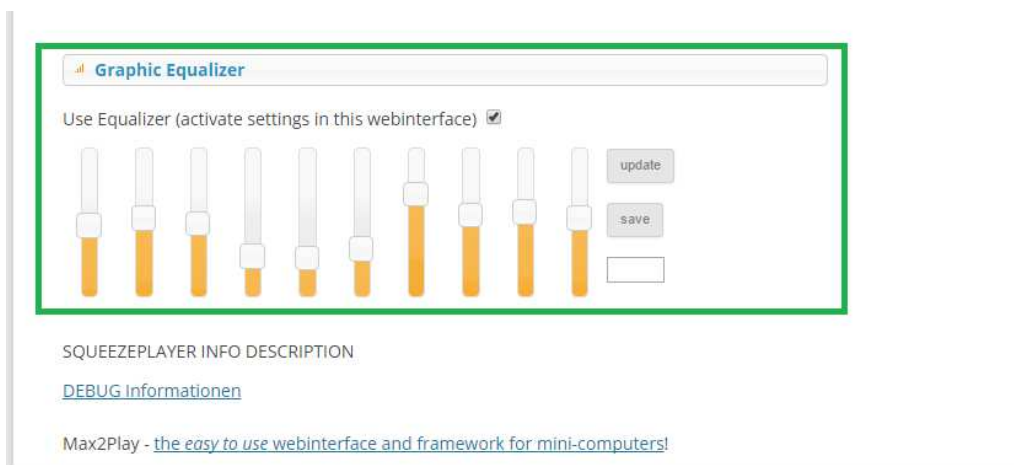
Low Pass : This is available only for 2.1 system and not available in 2.0 system

We can change the crossover cutoff frequency via the Max2play Web based GUI, Change in the Cutoff can be done on-the-fly too.

Logitech Media Server:

Installation Procedure:

1. Open the Max2play web page, within that get into the "Squeezebox server" tab.

2. Under "Squeezebox server" tab, Click on "Show available version" to show the available version of Squeezebox server.

3. Choose the recent version then click the "Squeezebox server start installation" button.
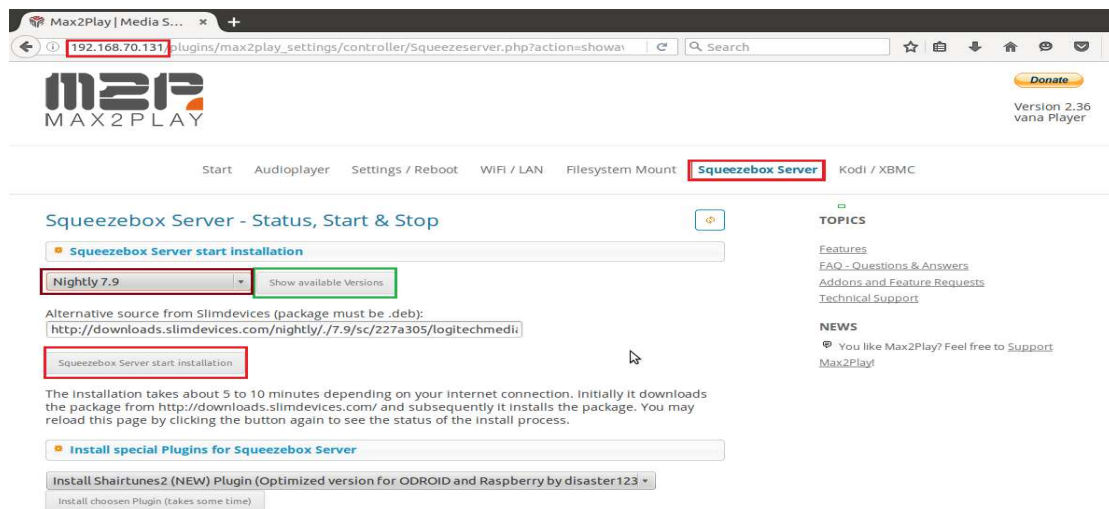
4. It will take approximately 10 min to complete the installation. Every 3 sec the page gets refreshed.
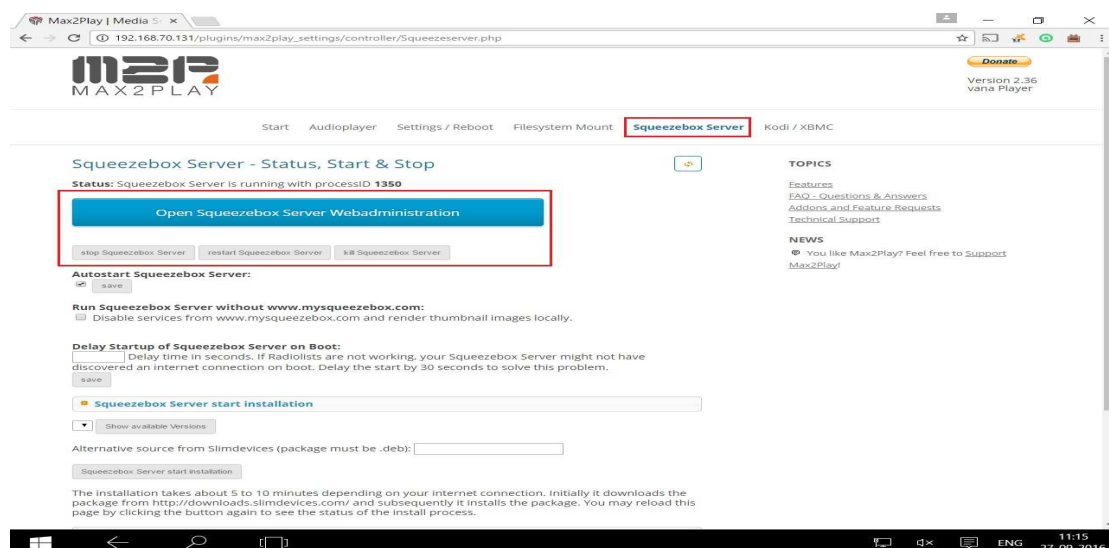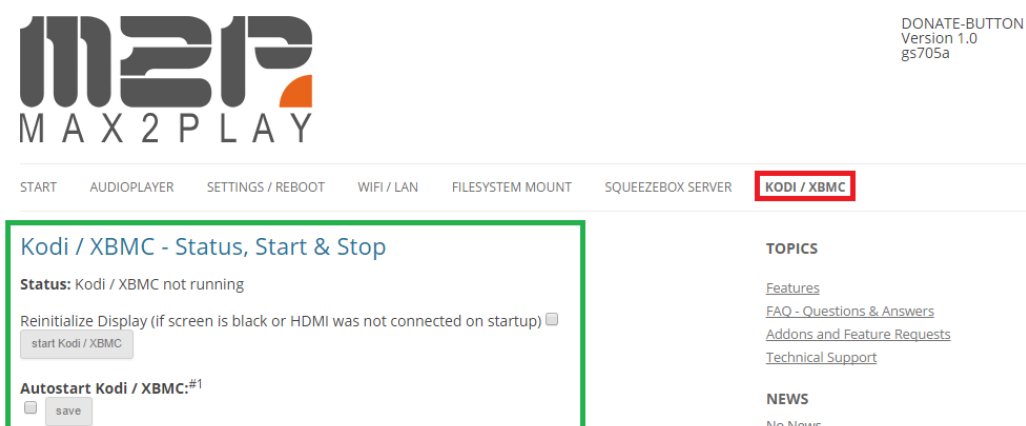
5. After completion of the LMS server installation, it will show the options of squeezebox server as shown below.
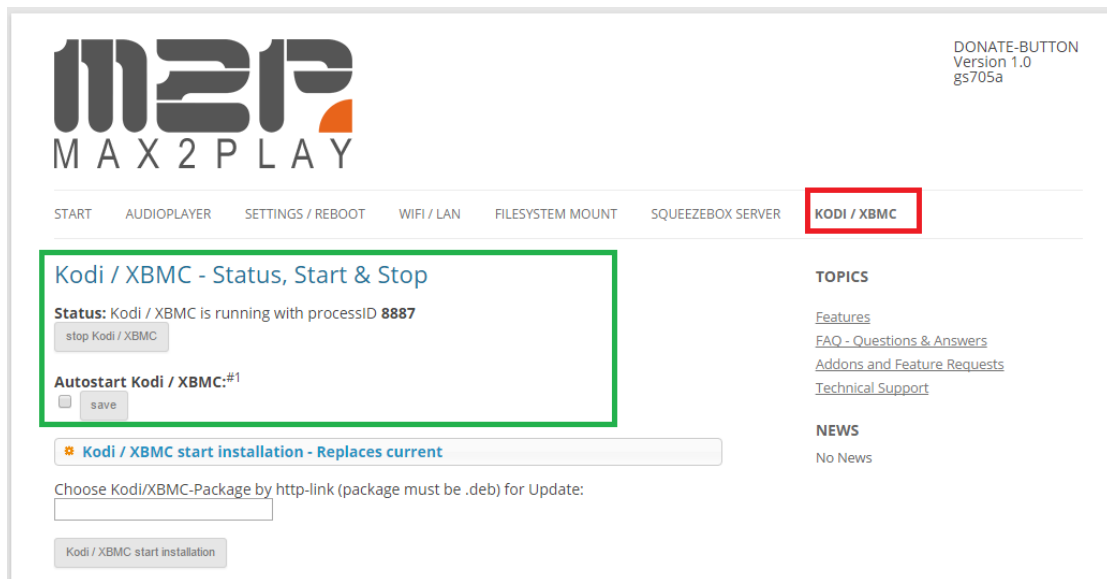

Kodi:

Max2play Provides an interface to the Kodi Player, To control this player enter into "KODI / XBMC" page of Max2play page as shown below:

Connect HDMI Cable to the SBC and then click on the Start button under the "Kodi / XMBC - Status, Start & Stop", Once done we can see the Kodi player on the HDMI.

Configure the path to your files

Choose the "FILESYSTEM MOUNT" menu to configure the path to your Media-Files like music, movies, pictures etc. Your Media-Files can be saved at different locations: On the SD-Card of the Vana Player itself, on an attached USB-drive, or on a Samba or NFS Network-Share. If the Media-Files are stored on the SD-Card you booted from, there is no need to do anything here. If it is stored on a USB-drive, this will be mounted automatically to /media/usb and /media/usb0.

If you attach more than one USB-drive, they will be mounted to /media/usb1 to /media/usb7. If your Media-Files are stored on a network location, you have to configure it from this site. Everything you will need to do is explained here. If you like to enable the Player to work as a Samba-Server, go to the section "Sambashares on Max2Play – setup network share paths". If configured correctly, you are now able to see your Player as a network-share for the PCs in your home LAN. You can now easily transfer files to your Player from other computers in your Home-LAN.

How to:

There are different ways to play audio From Vana Player:

Logitech Media Player: Using this player we can play audio files present in different locations like

1) Local Folder
2) Radio
3) Services like Qobuz
4) Youtube via BubbleUpnp

This player can be controlled using the web interface by clicking on the Open squeezebox server web administration present under squeezebox server tab

This player can also be controlled using Android Apps like Vana Player, AngryGoat, OrangeSqueeze etc.

Make sure both Squeezelite and Logitech Media Server are started.

1) Local Folder:

The audio Files are present inside the Local storage of Vana Player. To play these audio files using the LMS web interface GUI Open the LMS server web administration page select Myusic under that the folder which is configured in the configuration page of Max2Play.

To Play the files select the file and click on the play button and click the "+" to add the audio file into the current Playlist:

Home > My Music > Music Folder > music
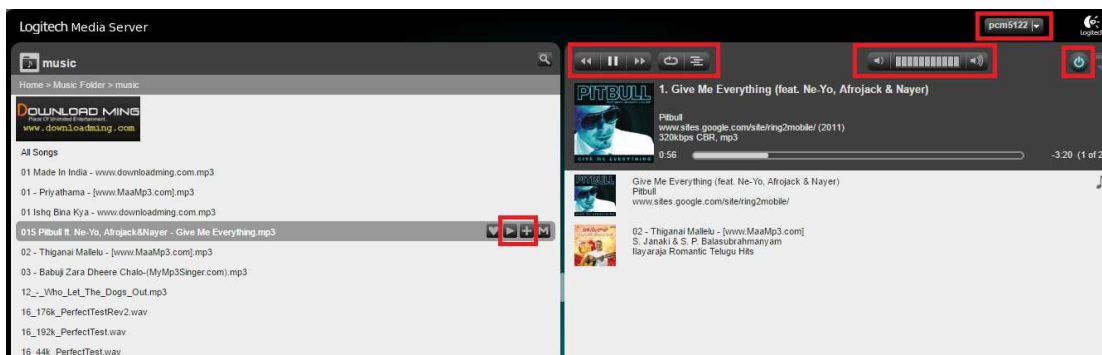
2) Radio:

To play Radio channels choose the Radio station from the Logitech Media Server Web GUI as shown below:
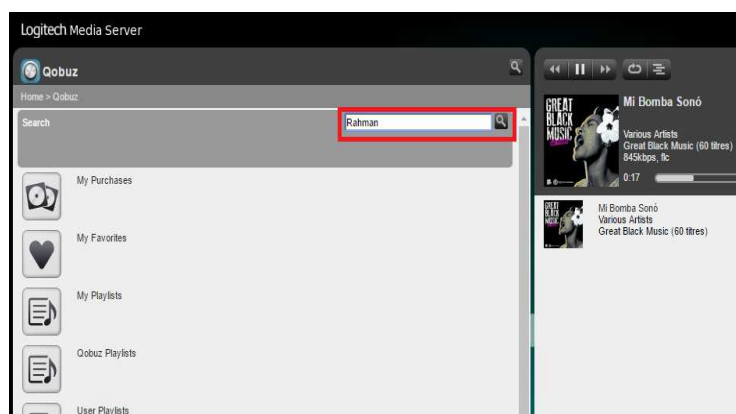
3) Players like Qobuz:

To start using this service we need to enter the Qobuz user-name and password this can be entered in Player WEB interface there is settings option after that we have to select Qobuz from the drop-down list this will open the page to enter the qobuz login and password, after this the squeezebox server has to be restarted.

The user name and password have to entered only one time this will be retained for subsequent reboots.
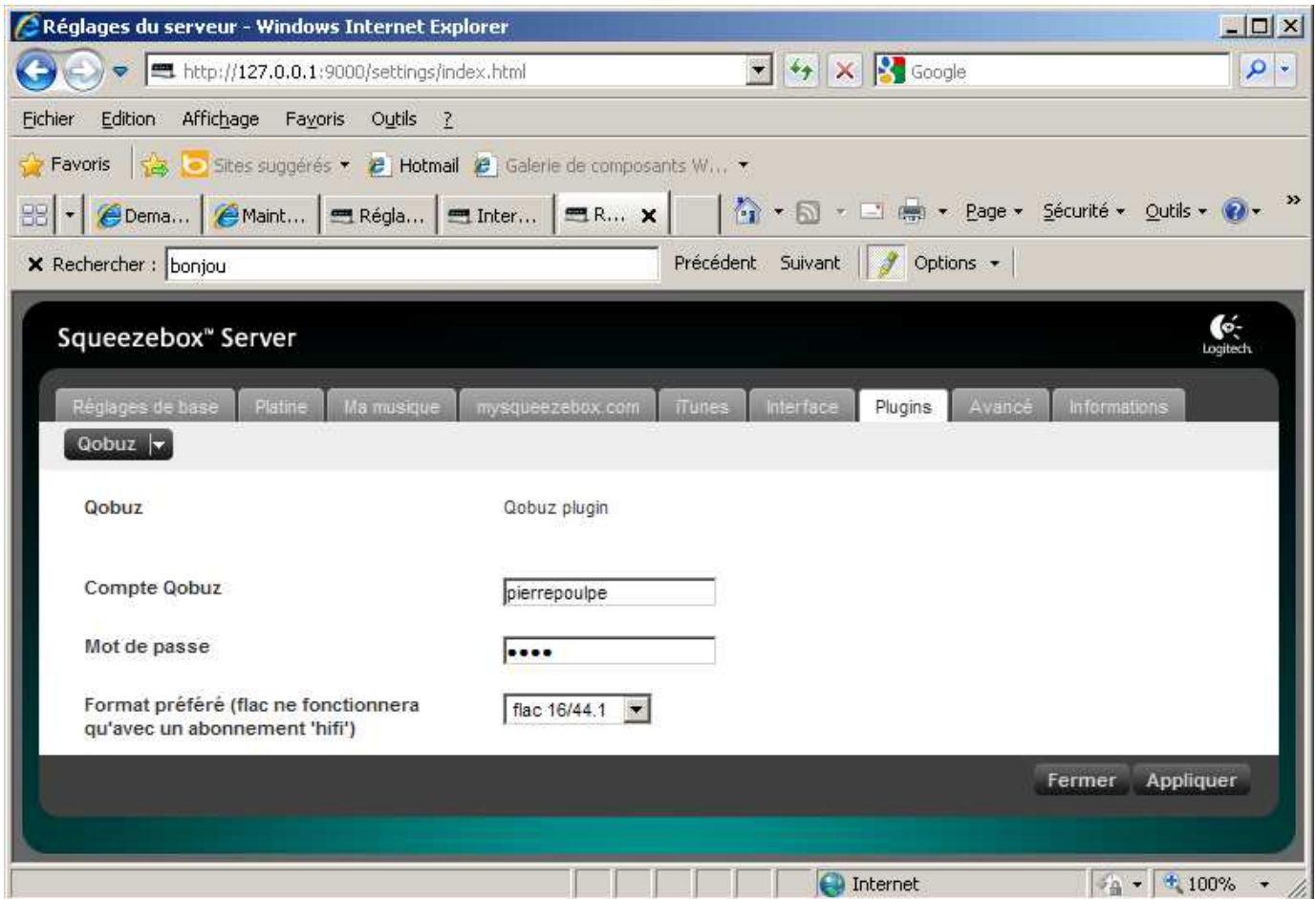
To play audio files Choose Qobuz from "My App" from the Logitech Media Server Web GUI, Once entered into the Qobuz search for a song and click on "Play" button of a selected song to play:

Home > My App > Qobuz

4) Android Apps:

To control playback form squeezelite we can use Android Apps installed on to the Smart Phone.

A) Angry Goat:

   Using this app we can play the audio from the Local Folder, Radio and Streaming Players like Qobuz via Logitech Media Server.

B) Bubble UPNP:

   Using this App we can play the audio from the Local Folder(Files present on the Smart Phone), and Streaming Players like Qobuz.
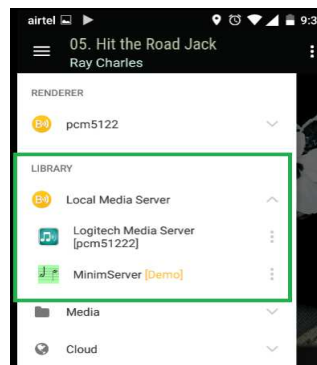
   Renderer:

   To select a device, Once we open the Bubble-Upnp click on the Left top icon and click on the device name to select it. "Local Renderer" is the Local smart phone device and "pcm5122" is the SBC Vana:
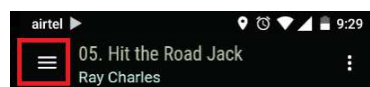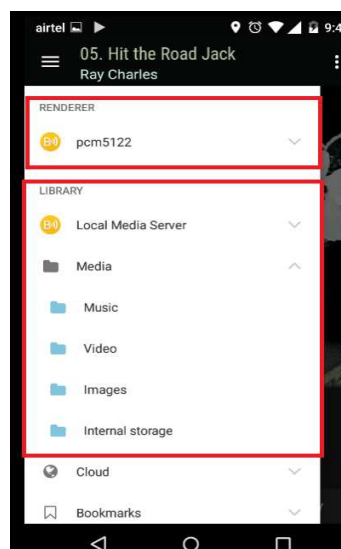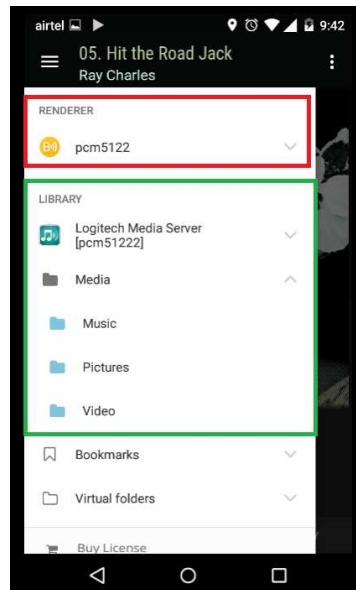

   Library:

   Media Sources present on the network:


   i.   To play the songs from the Local Folder .i.e, Files present on the Smart Phone:
       a) Select the device from the Renderer list.
       b) Select the "Local Media Server" from the Library.
       c) Click on Music Folder and select the audio file from the Music folder.

ii. To play the Audio files present on the Logitech Media Server.
   a) Select the device from the Renderer list.
   b) Select the "Logitech Media Server" from the Library.
   c) Click on Music Folder and select the audio file from the Music folder.

iii. To play the audio via Qobuz.
   a) Select the device from the Renderer list.
   b) Select the "Local Media Server" from the Library, Only then we can be able to see the "Cloud" option.
   c) Select "Qobuz" from the "cloud"
   d) The user name and password will be asked only for the first time please enter the qobuz user name and password.
   e) Click on Music Folder and select the audio file from the Music folder.
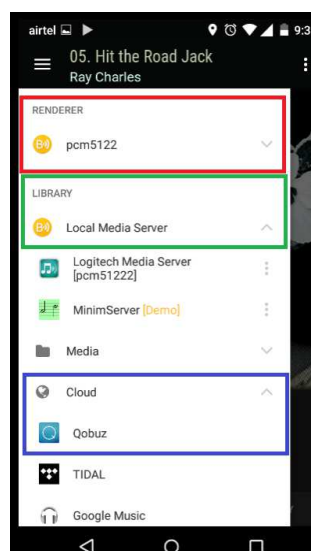
C) Orange Squeeze:
   Using this app we can play the audio from the Local Folder, Radio and Streaming Players like Qobuz via Logitech Media Server

Kodi Media Server:

Start the Kodi from the Max2play web Page as shown above and once the Kodi player is up on the Display screen we can control it through the "Kore" Android App to control the Kodi.

(imp: Once Kodi is started the Players Squeezelite and Shairport will stop and will restart only when the Kodi is stopped if auto start is enabled for both the players if not then the players will not restart)

Kodi Configuration on SBC:

We need to configure the following settings in order to make the Kore Android App to work with the Kodi Media Server:

Turn on the following settings in Kodi to enable using a smart phone or tablet remote:

Settings → Services → Remote control → Allow programs on other systems to control Kodi → ON

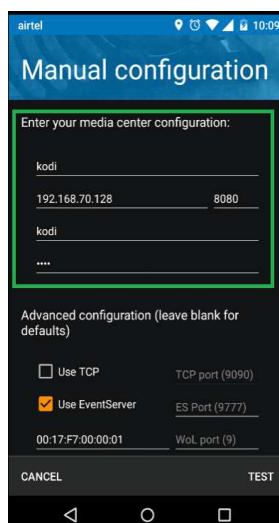This setting enables the basic ability to remotely control Kodi.

Settings → Services → Webserver → Allow control of Kodi via HTTP → ON

Many smart phone remotes also display additional library data, such as images and summaries. This setting allows that extra data to be transmitted to your remote app. Take note of the Port number, the User name and the Password (if any).

Kore Android App Configuration inorder to Connect it to the Kodi Media Server:

Make sure your phone and your Kodi device are on the same network. If you don't connect your phone to your home wireless network, you'll need to do so before you setup Kore.

a) Once installed open Kore and we will get an "Add Media Center" window click on next to find kodi on to the network.
b) If the Kodi details are not configured then device wont detect and Display "No Media Center found".
c) Click "Next" to configure the Kodi details as shown below and click on "TEST" to connect to the Kodi Media Server:
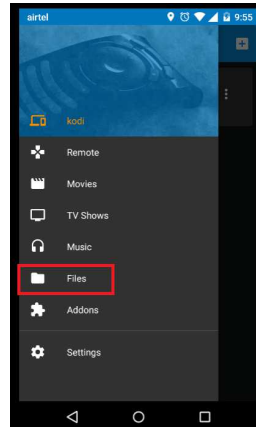
There are different ways to play audio through Kodi server:

1) Audio and Videos from local Folder
2) Audio and Video from the Remote Folder
3) Android App like BubbleUpnp
4) Youtube via BubbleUpnp

1) *Audio and Videos from the local folder:*
Select the menu and select the "Files" folder -> Video/Music/Pictures.

2) *Audio and Video from the Remote Folder*
This can be achieved using BubbleUpnp Android App:

   a) Start BubbleUpnp Android App and select "Kodi" as renderer as shown below.
   b) Go to the local video (Video files present inside the Smart phone) share it via Bubbleupnp and once done Video will be played on the SBC Kodi display screen.
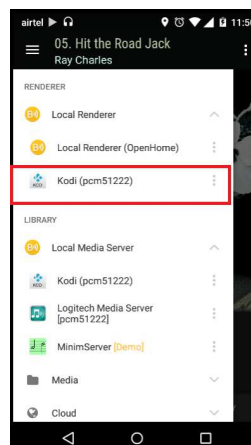
3) *Android App like BubbleUpnp*
Connect the Kodi as a renderer on the BubbleUpnp Android App and we can go to the Local or the Remote Library as shown in the above topic "Android Apps" BubbleUpnp.

4) *Youtube via BubbleUpnp*
Select the Renderer as Kodi on Bubbleupnp App and then open Youtube Video Share the Video via BubbleUpnp App.